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9-28-06

AF/ZJW

IN THE UNITED STATES PATENT OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

In re: Jason C. Pearson, Max A. Weaver, and Michael J. Cry	:	Art Unit: 1714 Examiner: K. A. Sanders
Date filed: September 10, 2003	:	
Serial No.: 10/659,225 Confirmation No.: 5733	:	Docket No.: 71593 Date Mailed: September 27, 2006

Title: Method For Reducing The Acetaldehyde Level in Polyesters

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

CERTIFICATE OF MAILING 37 CFR 1.10

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Date: September 27, 2006

Mark L. Davis
Signature

EJ636806302US
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Mark L. Davis
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TRANSMITTAL OF APPEAL BRIEF FEE
37 C.F.R. § 1.17(c)

Sir:

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed August 28, 2006.

Payment of the appeal fee:

☐ A check in the amount of _____ payable to _____ is enclosed.

☐ Please charge my credit card, (enclose credit card form)

☒ Please charge deposit account the appeal fee of $500.00 to Deposit Account No. 05-0221 in the name of Eastman Chemical Company. The Commissioner is hereby authorized to charge any additional fees under 37 CFR 1.16 and 1.17 which may be required by this paper or

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credit any overpayment to Deposit Account No. 05-0221. A duplicate of this transmittal is enclosed.

Respectfully submitted,

Mark L. Davis
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APPEAL BRIEF
37 C.F.R. §41.37

This appeal brief is in furtherance of the Notice of Appeal filed in this case on August 28, 2006.

Accompanying the Appellants' Brief is TRANSMITTAL OF APPEAL BRIEF FEE authorizing payment of the requisite fees under 37 C.F.R. §1.17(c), including any fees necessary for an extension of time.

This undersigned representative is submitting this Appeal Brief pursuant to 37 CFR 1.34.

The filing of this Appeal Brief is timely as shown below:

1. A final office action was mailed May 24, 2006 rejecting claims 53,59,65-69 and 71 pending in the application. Claims 44-52, 54-58, 60-64, 70 and 72-77 are pending in the case but are withdrawn from consideration.

2. A reply after final, without amendment to the claims, was filed August 1, 2006.

3. An advisory to the reply was mailed August 15, 2006 setting the time for reply 3 months from the date of the final rejection.

4. A Notice of Appeal was timely mailed pursuant to 37 C.F.R. §1.8 on August 24 2006.

This appeal is from the final office action rejecting Claims 53, 59, 65-69 and 71.

TABLE OF CONTENTS

I. REAL PARTY IN INTEREST

The real party in interest is Eastman Chemical Company, a Delaware corporation having a principal place of business at Kingsport, Tennessee.

II. RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to appellants, the appellants' legal representative, or assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

III. STATUS OF CLAIMS

Claims 44-77 are pending in the application

Claims 44-52, 54-58, 60-64, 70 and 72-77 are pending in the case but have been withdrawn from consideration.

Claims 53,59,65-69 and 71 stand finally rejected.

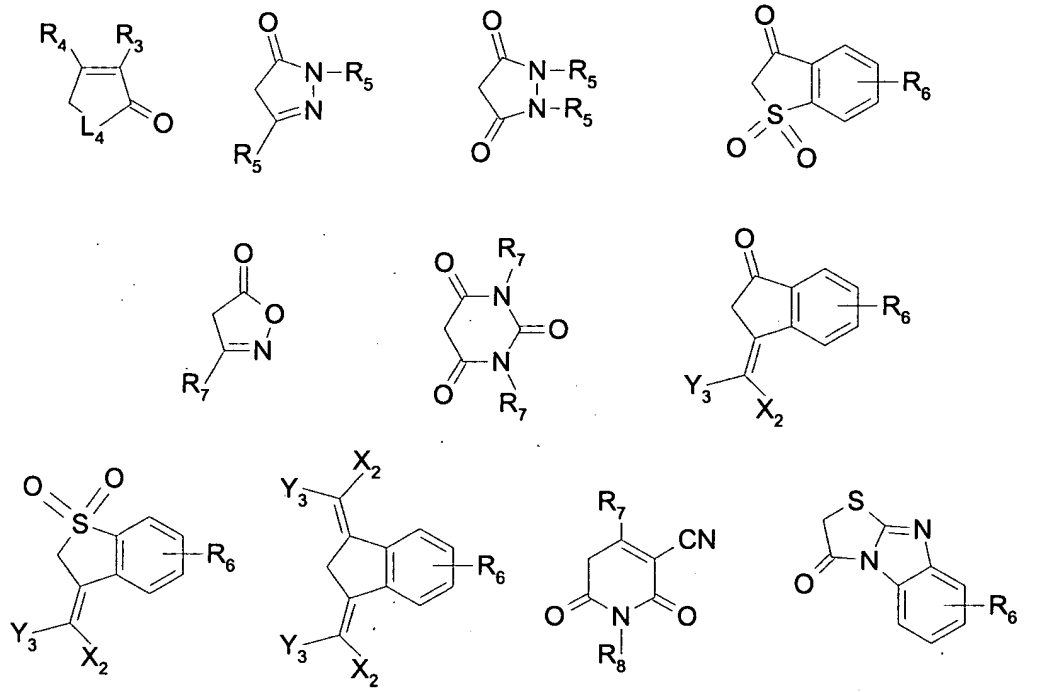
Claims 53,59,65-69 and 71 are being appealed and appear in the Claims Appendix.

IV. STATUS OF AMENDMENTS

The response after final mailed August 20, 2001 was entered and an Advisory action was mailed August 15, 2006.

V. SUMMARY OF INVENTION

In one embodiment, subject to an election of specie, the invention is directed to a polyester composition having at least one additive that is capable of reacting with acetaldehyde to form a new carbon-carbon bond. The additive is selected from the group consisting of cyclic active methylene compounds represented by the following formulae:



wherein R_3 is selected from C_1-C_6-alkoxycarbonyl, cyano, heteroaryl;

wherein R_4 is selected from aryl and heteroaryl;

wherein R_5 is selected from hydrogen, C_1-C_6-alkyl, substituted C_1-C_6-alkyl, C_3-C_8-cycloalkyl and aryl;

wherein R_6 is selected from hydrogen, C_1-C_6-alkyl, C_1-C_6-alkoxy, halogen, cyano, C_1-C_6-alkoxycarbonyl, trifluoromethyl, hydroxy, C_1-C_6-alkanoyloxy, aroyl, C_1-C_6-alkylthio, C_1-C_6-alkylsulfonyl, carbamoyl, sulfamoyl, -$NHCOR_9$, -$NHSO_2R_9$, -$CONHR_9$, -$CON(R_9)_2$, -SO_2NHR_9 and -$SO_2N(R_9)_2$; wherein R_9 is selected from C_1-C_6-alkyl, substituted C_1-C_6-alkyl, C_3-C_8-cycloalkyl and aryl;

wherein R_7 is selected from hydrogen, C_1-C_6-alkyl, and aryl;

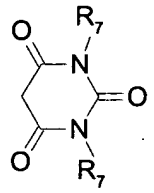
wherein X_2 and Y_3 are independently selected from cyano, C_1-C_6-alkylsulfonyl, arylsulfonyl and C_1-C_6-alkoxycarbonyl;

wherein R_8 is selected from hydrogen, C_1-C_6-alkyl, substituted C_1-C_6-alkyl, C_3-C_8-cycloalkyl, C_3-C_8-alkenyl, C_3-C_8-alkynyl and aryl; and

wherein L_4 is selected from -O-, -S- and -N(R_{10})-, wherein R_{10} is selected from hydrogen, C_1-C_6-alkyl, C_3-C_8-cycloalkyl and aryl.

See page 6, line 11 through page 7, line 19 of the specification.

With regard to the election of specie of cyclic compounds having an active methylene moiety, the invention includes a polyester having an additive that is capable of forming a new carbon to carbon bond wherein the additive has the formula:



wherein R_7 is as defined above.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 53, 59, 66 and 71 are anticipated under 35 U.S.C. § 102 (b) in view Mogami et al. (USPN 5,684,071).

2. Whether claims 65-69 are unpatentable under 35 U.S.C. § 103 (a) over Mogami et al. in view of Sargeant et al. (USPN 6,593,406) and further in view Igrashi et al. (USPN 4,837,115).

VII. ARGUMENT

A. REJECTIONS UNDER 35 U.S.C. § 102 (b) OVER MOGAMI ET AL.

1. Claims 53, 59, 66 and 71

The examiner rejected claims 53, 59, 66 and 71 under 35 U.S.C. § 102 (b) as being anticipated by Mogami et al. (USPN 5,684,071). The examiner maintains that Mogami et al. teaches polyester compositions that include barbituric acid and its derivatives and identifies column 3, line 50 through column 4, line 35 of the '071 patent specifically. Applicants respectfully submits that this is an error.

It is well established that for a claim to be anticipated under 35 U.S.C. § 102, the reference must set forth each and every element of the claim.

Mogami et al. disclose an additive for thermoplastic resins which have improved dispersibility into the resin and which impart a high degree of flame resistance to the polyester resin without impairing mechanical properties, column 1, lines 9-14 and column 2, lines 41-48. Mogami et al. teach that the compatibility of nitrogen-containing heterocyclic compounds can be improved by surface treating the heterocyclic compounds with a compound having at least two functional groups, such as an epoxy, acid anhydride, isocyanate, oxazoline or carbodiimido group, column 2, lines 65 through column 3, line 4.

Applicants submit that Mogami et al. does not anticipate claims 53, 59 and 71. Applicants' claimed invention is a polyester having an additive that is capable of reacting with acetaldehyde to form a new carbon-carbon bond. This limitation is not disclosed either expressly or inherently by Mogami et al.

Additionally, Mogami et al. specifically teach functionalizing the nitrogen-containing heterocyclic compounds by treating them with a compound having at least two functional groups. Applicants invention does not treat the cyclic compound with a functionalizing compound having at least two functional groups, such as an epoxy, acid anhydride, isocyanate, oxazoline or carbodiimido group. Thus, claims 53, 59, and 71 are not anticipated by Mogami et al.

Secondly, the examiner maintains that Formula II of Morgami et al. teach barbituric acid, (also known as pyrimidinetrione), which the Applicants also submit is an error. Following traditionally understood chemical representations, when the carbons, nitrogens, halides, etc. are clearly indicated in a structure, then the appropriate bonds and valences are also represented. This traditional chemical representation was clearly followed by Mogami et al. as is seen in the structures represented in formulae I and III wherein all carbons have four bonds, nitrogens have three, and the respective R groups have one. This traditionally understood chemical representation was further followed in formula II wherein all, nitrogens have three bonds, R groups have one, and the all carbons, except the "C-R^5", have four. The problem with the structure of Formula II is the carbon having the R^5 group is a trivalent carbon, which does not exist. The "C-R^5", is the only representation that is amiss. Applicants submit the "C-R^5", carbon atom should be a nitrogen atom.

Although inventors or patentees can be their own lexicographers, defining terms within the specification to have a specialized meaning and for limiting the description or clarity of the claims, it is required that the use of such terms remain consistent in their use. It is noted that in Mogami et al. all carbons have 4 bonds, nitrogens 3 and R groups have 1. However, in Formula II the carbon associated with R^5 has only 3 bonds, which is completely contrary to accepted depiction for carbon bonds by those skilled in the art and is also contrary to the methodology selected and used by Mogami et al. Thus, this moiety must be something other than a carbon atom.

Looking to the description for clarifying what Formula II should be, the patentee gives representative compounds of Formula II as cyanuric acid, isocyanuric acid, triphenyl cyanurate, and triphenylisocyanurate. These compounds have three nitrogens in the ring structure. Clearly, for Formula II to make any sense the "C-R^5" depicted must be --N-R^5--. To be otherwise renders the methodology of structural representation selected by the patentees unclear; clearly renders the description of the moieties R^4, R^5 and R^6 to be wrong, since they can be the same and R^5 would need to be a double bonded molecule but instead are selected from groups having only one bond available (hydrogen, amino, aryl or a hydroxyalkyl group having from 1 to 3 carbon atoms); and clearly renders the representative examples of Formula II

incorrect. Accordingly, one skilled in the art would understand in Formula II the "C-R^5" to be --N-R^5--. Thus, Mogami et al. would not anticipate claims 53, 59, and 71.

Claim 53

Appellants submit that claim 53 is not anticipated by Mogami et al., since the teaching of the '071 reference would not anticipate the non-elected specie identified in claim 53 (compounds selected from furanones, thiophenones, pyrrolones; pyrazolones; pyrazolidinediones; indanediones, benzothiophenedioxides; isoxazolones, dimedone, substituted vinylindan-1-ones; indanes, and the like). Therefore claim 53 should not stand or fall with claims 59 and 71.

B. REJECTIONS UNDER 35 U.S.C. § 103 (a) OVER MOGAMI ET AL. (USPN 5,684,071) IN VIEW OF SARGEANT ET AL. (USPN 6,593,406) AND IGRASHI ET AL. (USPN 4,837,115).

Claims 65-69

The examiner rejected claims 65-69 under 35 U.S.C. § 103 (a) as being obvious over Mogami et al. in view of Sargeant et al. (USPN 6,593,406) and further in view of Igrashi et al. (USPN 4,837,115). The examiner maintains that Sargeant et al. disclose the addition of UV absorbing compound and HALS in a polyester and Igrashi et al. discloses the use of an amino-group containing compound for the scavenging of acetaldehyde. The examiner further maintains that barbituric acid and its derivatives have inherent acetaldehyde scavenging properties due to the amine groups present on the compounds. Applicants submit that claims 65-69, as grouped with the independent claim 53, are patentably distinguishable over the combination of Mogami et al. in view of Sargeant et al. and Igrashi et al.

As noted above, Applicants submit that Mogami et al. does not teach or suggest the elected specie of independent claim 53 and is patentably distinguishable over Morgami et al. To establish a *prima facie* case of obviousness the following tenets must be considered by the examiner: 1) the claimed invention must be considered as a whole; 2) the references must suggest the desirability and the obviousness of making the combination; 3) the teaching of the references must be viewed without the benefit of using the teaching of the claimed invention, i.e., without using impermissible hindsight to reconstruct the claimed invention; and 4) there must be a reasonable expectation of success that the claimed invention will work for its intended use. Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986), *cert. denied*, 485 U.S. 1007 (1988). Applicants submit that the examiner has not followed these tenets to establish a *prima facie* case of obviousness.

Appellants submit that the examiner has not considered the claimed invention as a whole. Appellants submit that the examiner is in error by not considering all the claim limitations, i.e., that the polyester additive compound is at least one cyclic compound with an active methylene capable of reacting with acetaldehyde to form a new carbon-carbon bond. This limitation is not

taught or suggested in any of the references since, as noted above, Mogami et al. does not teach or suggest barbituric acid and the combination of Sargeant et al. and further Igrashi et al. does not suggest to one skilled in the art to modify Mogami et al. to derive barbituric acid. To do so would be destroy the clear teaching and purpose of Mogami et al.

Appellants submit that the combination of Mogami et al., and Igrashi et al. actually teaches away from the claimed invention. Igrashi et al clearly state that it is a terminal amino group that reacts with the aldehyde, which forms a nitrogen-carbon bond, not a carbon-carbon bond as specified by the present invention, column 2, lines 66 through column 3, line 20.

Applicants submit that there is no teaching or motivation to derive the present invention from the combination of Mogami et al., Sargeant et al. and Igrashi et al. without the teaching of the present application. As noted above, Mogami et al., and Igrashi et al. each are directed to amino linkages: Mogami et al., is directed to functionalizing the compound for improved flame resistance and Igrashi et al. using terminal amino groups for reducing acetaldehyde in a polyester. There is nothing that would teach or suggest using a cyclic compound having an active methylene to react with acetaldehyde to form a new carbon-carbon bond to reduce acetaldehyde in a polyester.

Lastly, there is no expectation of success that the claimed invention will work for its intended purpose since Mogami et al., is directed to flame resistance, Sargeant et al. is directed to using HALS for UV stabilization and Igrashi et al. is directed to using linear compounds having a terminal amine group for acetaldehyde scavaging. There is simply no teaching or suggestion for using the elected compound for reducing acetaldehyde concentration in a polyester by forming a new carbon-carbon bond.

Thus, one skilled in the art would not derive the invention of claims 65-69 by combining the teachings of Mogami et al. in view of Sargeant et al. and further in view of Igrashi et al. either alone or in any combination.

Respectfully submitted,

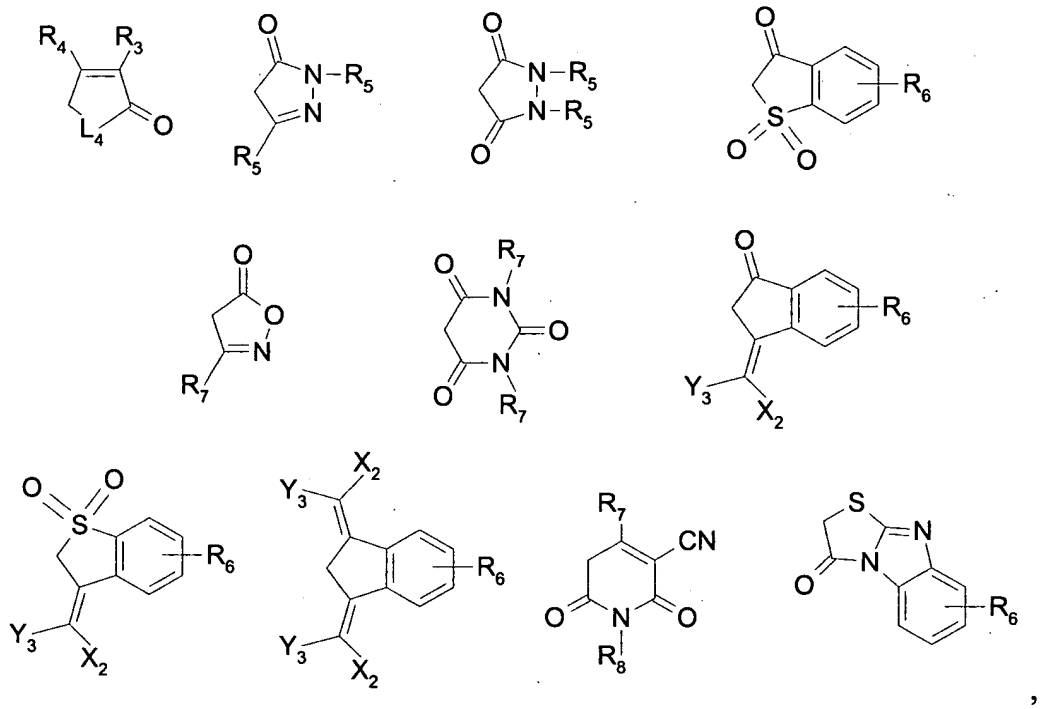
Mark L. Davis
Attorney for Applicants
Reg. No. 34,574

VIII. CLAIMS APPENDIX

53. A polyester composition comprising:

(a) a polyester; and

(b) at least one additive that is capable of reacting with acetaldehyde to form a new carbon-carbon bond, said additive selected from the group consisting of cyclic active methylene compounds represented by the following formulae:



wherein R_3 is selected from C_1-C_6-alkoxycarbonyl, cyano, heteroaryl;

wherein R_4 is selected from aryl and heteroaryl;

wherein R_5 is selected from hydrogen, C_1-C_6-alkyl, substituted C_1-C_6-alkyl, C_3-C_8-cycloalkyl and aryl;

wherein R_6 is selected from hydrogen, C_1-C_6-alkyl, C_1-C_6-alkoxy, halogen, cyano, C_1-C_6-alkoxycarbonyl, trifluoromethyl, hydroxy, C_1-C_6-alkanoyloxy, aroyl, C_1-C_6-alkylthio, C_1-C_6-alkylsulfonyl, carbamoyl, sulfamoyl, -$NHCOR_9$, -$NHSO_2R_9$, -$CONHR_9$, -$CON(R_9)_2$, -SO_2NHR_9 and -$SO_2N(R_9)_2$; wherein R_9 is selected from C_1-C_6-alkyl, substituted C_1-C_6-alkyl, C_3-C_8-cycloalkyl and aryl;

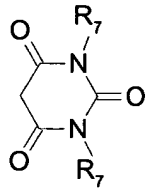
wherein R_7 is selected from hydrogen, C_1-C_6-alkyl, and aryl;

wherein X_2 and Y_3 are independently selected from cyano, C_1-C_6-alkylsulfonyl, arylsulfonyl and C_1-C_6-alkoxycarbonyl;

wherein R_8 is selected from hydrogen, C_1-C_6-alkyl, substituted C_1-C_6-alkyl, C_3-C_8-cycloalkyl, C_3-C_8-alkenyl, C_3-C_8-alkynyl and aryl; and

wherein L_4 is selected from -O-, -S- and -$N(R_{10})$-, wherein R_{10} is selected from hydrogen, C_1-C_6-alkyl, C_3-C_8-cycloalkyl and aryl.

59. The polyester composition of claim 53 wherein the additive is a compound having the general formula:



65. The polyester composition of claims 44 or 53 further comprising 1-99 weight percent of a post-consumer recycled material.

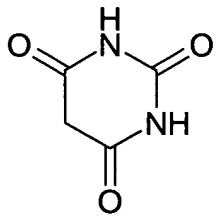
66. The polyester composition of claim 44 or 53 further comprising 0.01 to 10 weight percent of at least one colorant and/or ultraviolet light absorbing compound in the polyester.

67. The polyester composition of claim 44 or 53 further comprising an infrared absorbing compound selected from carbon black, black iron oxide, reduced antimony metal catalyst residues, metal phthalocyanines, metal naphthalocyanines, and squaraines.

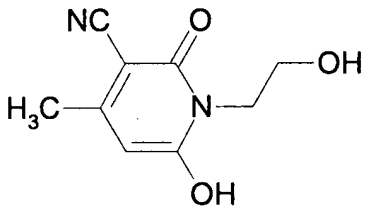
68. The polyester composition of claim 53 further comprising one compound known to catalyze the reaction between an acidic methylene and an aldehyde selected from the group consisting of hindered amine light stabilizers (HALS), amino acids, alkali metal salts of mono- and poly-carboxylic acids, tertiary amines, secondary amines.

69. The polyester composition of claim 44 or 53 further comprising a non-sticking additive selected from lubricants, inorganic mineral composites, and talc.

71. The polyester composition of claim 53 wherein the additive is selected from the group consisting of compounds having the formula:



, and


NC
O
OH
H_3C
N
OH

IX. EVIDENCE APPENDIX

1. U.S. Patent No. 5,684,071.

2. U.S. Patent No. 6,593,406.

3. U.S. Patent No. 4,837,115.

4. Hodosh v. Block Drug Co., Inc., 786 F.2d 1136, 229 USPQ 182, (Fed. Cir. 1986).

X. RELATED PROCEEDINGS APPENDIX

None.

OIPE
SEP 27 2006
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786 F.2d 1136
229 U.S.P.Q. 182
Milton HODOSH and Richardson-Vicks, Inc., Appellants,
v.
BLOCK DRUG COMPANY, INC., et al., Appellees.
Appeal No. 85-2607.
United States Court of Appeals,
Federal Circuit.
March 24, 1986.

John O. Tramontine, Fish & Neave, of New York City, argued for appellant, Richardson-Vicks, Inc.

Hugh A. Chapin, Kenyon & Kenyon of New York City, argued for appellant, Milton

Hodosh. With them on the brief were W. Edward Bailey and Norman H. Beamer of Fish & Neave and Paul Lempel and William J. McNichol, Jr. of Kenyon & Kenyon.

Jerome G. Lee, Morgan, Finnegan, Pine, Foley & Lee, of New York City, argued for appellees. With him on brief were William S. Feiler and Maria C.H. Lin of Morgan, Finnegan, Pine, Foley & Lee, and Marvin C. Soffen and Edward A. Meilman, Ostrolenk, Faber, Gerb & Soffen.

Before RICH, DAVIS, and BALDWIN, Circuit Judges.

RICH, Circuit Judge.

This appeal is from the July 12, 1985, judgment of the United States District Court for the District of New Jersey, 226 USPQ 645, granting summary judgment to Block Drug Company, Inc., et al. (Block) and holding that all six claims of patent No. 3,863,006 for "Method of Desensitizing Teeth" ('006 patent), issued to Dr. Milton Hodosh and licensed to Richardson-Vicks, Inc. (collectively, Hodosh), are invalid for obviousness under 35 U.S.C. Sec. 103. We reverse and remand.

Background

Tooth desensitizers reduce discomfort and pain caused by tooth hypersensitivity or exposed dentin, the portion of the tooth between the enamel and the pulp which includes a myriad of microscopic tubules. Persons suffering from this condition react painfully to hot or cold foods, citric acid or sweets, or everyday chemical, thermal, or tactile stimuli including toothbrush contact.

Milton Hodosh, a practicing dentist for about thirty years, independently developed the claimed subject matter of the '006 patent and granted Richardson-Vicks an exclusive license to make, use, and sell the claimed invention; the latter markets its tooth desensitizing toothpaste under the trademark "Denquel."

Claim 1 of the '006 patent [1] reads:

The method of desensitizing hypersensitive dentin and cementum by applying thereto an agent the essential ingredient of which is a nitrate of one of the following alkali metals: potassium, lithium or sodium said nitrate comprising between 1 percent and 20 percent by weight of said agent.

The remaining claims appear in the opinion below.

Appellee Block has, since 1961, marketed a tooth desensitizing toothpaste, covered by its patent No. 2,122,483 (the Rosenthal patent) for "Strontium Ion Toothpaste" issued in 1964, under the trademark "Sensodyne." The Rosenthal patent and the '006 patent disclose toothpaste formulae which are the same except that the latter contains, as a desensitizing agent, potassium nitrate instead of the Rosenthal-Block strontium chloride. After requesting and being denied a license under the '006 patent, Block developed its own potassium nitrate-containing tooth-desensitizing toothpaste called "Promise" and "Sensodyne-F." [2]

March 30, 1983, Hodosh sued Block alleging that the sale of "Promise" and "Sensodyne-F" contributorily infringed and actively induced infringement of the '006 patent. Block answered and counterclaimed alleging patent misuse and consequent unenforceability of the '006 patent. On July 11, 1984, Block moved for summary judgment as to both misuse and patent invalidity. Oral argument was heard October 16, 1984, and decision was reserved. June 14, 1985,

the reported decision was handed down granting the motion as to patent invalidity and dismissing the motion on misuse as moot, resulting in the judgment now on appeal.

The district court heard no expert testimony, but did hear arguments of counsel, receive briefs, review exhibits, and had before it declarations and affidavits from experts on both sides commenting on the eight prior art references involved here, including the Rosenthal patent. The court determined that there were no genuine issues of material fact and concluded as a matter of law that the claims of the '006 patent were invalid under Sec. 103 because the Rosenthal patent disclosed each element claimed in the '006 patent except the potassium nitrate, which, in its view, was disclosed in two Chinese references, both based on ancient Chinese writings. The court also stated that six European references supported its conclusion of obviousness.

Because the appropriateness of summary judgment is determined on an analysis of the facts, First National Bank of Arizona v. Cities Service Co., 391 U.S. 253, 88 S.Ct. 1575, 20 L.Ed.2d 569 (1968), and because everything about these references, as a whole, see, e.g., Interconnect Planning Corp. v. Feil, 774 F.2d 1132, 1138, 227 USPQ 543, 547-48

(Fed.Cir.1985), is important to our determination, we review the record and lay out the relevant portions of the references in some detail.

A. The Chinese References

1. The Grand Dictionary of Chinese Medicine and Drugs

(The Grand Dictionary)

The Grand Dictionary, published in Hong Kong in 1963 and written in Chinese, is based on ancient Chinese compilations assembled roughly 500 years ago from works of physicians going back 4000-5000 years. Only a portion of the 1963 Chinese text was before the court and is before us on appeal. For purposes of this litigation, that portion was translated into English by Block's translator, Roger Wei-Ming Tsao (Mr. Cao). Mr. Cao is a doctor of Chinese medicine and a bilingual tutor. Block's other expert, Dr. Stephen Wei, a professor of dentistry fluent in Chinese, concurred in that translation. The writings from which the Grand Dictionary was compiled are not in evidence nor are any earlier writings.

In a nutshell, the district court relied upon the Grand Dictionary because of its discussion of "xiao shi" to which the Grand Dictionary associates the name "niter" and the chemical composition KNO3 and the ability to cure, inter alia, tooth pain. The court's opinion was that this reference teaches the use of xiao shi, which is the same as niter and is therefore the same as potassium nitrate, to cure tooth pain; thus, the teachings of the Rosenthal patent and the Grand Dictionary show that the '006 invention would have been obvious.

The following discussion and quotations are part of an attempt to convey the nature of the Grand Dictionary. The translated portion of the Grand Dictionary is entitled "Niter." The text under the first subheading "Nomenclature" reads: "It was so named because it has the power to consume various stones." Under "Other Names Stated in Classical Medical Books," the text reads "Mang Xiao (Bie-Lu), Bitter Xiao (Zhen-Quan), Flaming Xiao (Tu-Su) ... and Xiao-Shi ...." Thereafter, following "Foreign Names," the Grand Dictionary reads: "Salpetrae, Salnitri (in Latin); Niter (in English); and Salpoter (in German)." One page later, "KNO3 " is listed under "Chemical Composition."

The portion upon which Block and the district court rely to show that this substance cures tooth pain is headed "Collective Statements" and reads:

(Ming): Li-Shi-Zhen said: It cures summer infections and the catching of colds. It cures acute enteritis with severe vomiting, exertion through excessive sexual activity, black jaundice, chronic abdominal pain, conjunctivitis, headaches and tooth pain.

The next three or so pages of the Grand Dictionary list the ailments that this substance cures. An interesting but not atypical

paragraph reads: "For curing the paralysis of the four limbs, leprosy or problems caused by Taoist stone eating." This substance also apparently cures indigestion, lack of energy, typhoid, cataracts, and much, much more. The Grand Dictionary compares what appears to be various forms in which xiao shi is found, and the characteristics of each. An excerpt is:

Pu-Xiao (Na2 SO4) has the nature of water, tastes salty, and its flavor is cold. It can only descend and cannot ascend. It is Yin within Yin--that's why it can cleanse the accumulation in the gastrointestinal tract and can expel the San-Jiao devilish fire. Whereas Niter (KNO3) has the nature of fire, tastes bitter and spicy, tastes slightly salty and has a flavor which is very warm, it's [sic] nature is ascending. It is fire within water. That's why it can break the accumulation and disperse hardness, and cure the febrile diseases.

2. Ben Cao Gang Mu

Ben Cao Gang Mu (Ben Cao) is a treatise on Chinese Medicine published in Hong Kong, in Chinese, in 1930, 1954, and 1965, but was originally written by Li-Shi-Zhen who lived during the Ming Dynasty. [3] Like the Grand Dictionary, only a portion of the Chinese text Ben Cao is in evidence and that portion was translated by Mr. Cao and Dr. Wei for purposes of this litigation. The district court relied upon Ben Cao because it discusses "xiao shi," which the translation of Ben Cao states is "niter" and associates the ability to cure "tooth pain (Ya Tong or Ya Teng)."

It is important to note, and the district court appeared to accept as fact, that the portion of the Grand Dictionary relied upon was compiled during the Ming Dynasty of the 13th to 15th centuries in Ben Cao Gang Mu so that the relevant portion of the Grand Dictionary is substantially a restatement of Ben Cao with some modification by an unidentified author. The court stated that these two references "quote the same Ming Dynasty source as labeling KNO3 for tooth pain."

The Ben Cao translation is entitled "Xiao-Shi (Niter)" and refers to the same "Other names" for this substance listed in the Grand Dictionary. With respect to the quoted sections above, the Ben Cao translation is nearly verbatim. It has this to say about tooth pain:

Da Ming states: It cures summer infections and the catching of colds, acute enteritis with severe vomiting, exertion thru excessive sexual activity and black jaundice, chronic abdominal pain, conjunctivitis, headache and tooth pain (Ya-Tong or Ya Teng).

Hodosh argues that summary judgment was inappropriate; issues of fact as to the meanings of xiao shi and ya tong remain because a skilled dental researcher would surely seek and obtain a complete translation of the Grand Dictionary and of the other ancient Chinese references and would read those references carefully. Hodosh also argues that the ancient references should be dismissed because a person skilled in the art would find them incredible and would regard them as a quagmire of medical and dental nonsense. It therefore takes issue with the court's holding quoted below which apparently precluded inquiry into the accuracy of the references by one skilled in the art:

[A]ttacks upon the translation leading up to the prior art reference embodied in the Grand Dictionary of Chinese Medicine and Drugs, ... or upon Chinese medicine as a whole, ... are not here regarded as particularly pertinent, since they require skill beyond the scope of the "experienced researcher in dental fields...."

Hodosh relies heavily on its expert's, Dr. Shklar's, testimony about the Chinese references: "[T]hey represent in modern terms, materials that are rarely comprehensible and frequently contradictory in their literal terms. The materials are largely

seen by contemporary medical scientists as absurd; no serious medical researcher would waste his or her time with them." [4] Hodosh also contests this holding by the district court:

Nor, if it is true that KNO3 alleviates tooth sensitivity, is such reference in the prior art rebutted by the existence of errors in the reference such as, for example, the claim that KNO3 is a cure for "exertion through excessive sexual activity." Whatever the merits of the other aspects of the Chinese references, the fact that they reveal KNO3 to be a cure for ya tong is what is dispositive here. The reference clearly discloses such function of potassium nitrate, albeit in the context of otherwise incredible, and even erroneous descriptions of the compound's quality.

With respect to the specific meaning of xiao shi as used in these references, both Dr. Shklar and Hodosh's other expert, Mr. Yen, a professional translator of Chinese and English languages, stated that the compiler of the Grand Dictionary erred in associating potassium nitrate or niter with xiao shi. Mr. Yen states that he

was not able to render one single precise version because various dictionaries contain different and even conflicting definitions. For example, Source of Words, a Chinese language dictionary, published by Commercial Press, Taiwan, which has editions dating back to 1915, defines "Xiao-Shi" as "Mang-Xiao" on page 1255, and under "Mang-Xiao" on page 1770, reference is made that "Mang-Xiao" is "Liu-Suen-Na," and on page 1523 "Liu-Suen-Na" is defined as sodium sulfate (Na2 SO4 10H2 0).

Mr. Yen also stated that "Xiao-Shi could be more than one material and that more than one material may be represented by the term 'Xiao-Shi'."

Dr. Shklar concurred:

In my opinion, therefore, the answer to the question: What was "Xiao-Shi," is that it represented many different materials which cannot be identified with certainty.

* * *

* * *

Thus, these Exhibits did not describe potassium nitrate to one skilled in the art any more than any of the hundreds of salts, ores and oxides that possess some of the enumerated properties.

In addition, Dr. Shklar stated: "It is insufficient to simply state, as the Block translator does, that 'Xiao-Shi' is 'niter,' and then cite a modern dictionary to 'establish' that 'niter' is potassium nitrate.". With respect to both the Grand Dictionary and Ben Cao, he stated that "the translator appears to have inserted the term 'niter' into the text where the phrase 'consumer of stones' actually belongs."

Block's arguments, on the other hand, in part based on the short affidavit by Mr. Wei, substantially follow the district court's opinion. Block also challenges the competence of Hodosh's experts stating that they "either had no knowledge or training in the Chinese language or Chinese medicine or were unfamiliar with dentistry or medicine generally." Block also emphasizes that the Chinese references correctly disclose many of potassium nitrate's characteristics, like burning with a violet flame, useability for making signal fires and gun powder, and its water solubility; these three properties of xiao shi in the Chinese references definitely confirm, according to Block, that xiao shi is potassium nitrate, KNO_3 .

B. The European Prior Art

This art is contained in six references and was not relied upon to any significant degree by Block or the district court. Hodosh scarcely mentions it on appeal, instead preferring to show the existence of genuine issues of material fact with respect to the Chinese references. After concluding that using potassium nitrate to cure tooth pain would have been obvious from Rosenthal in

view of the Chinese art, the court stated: "Such holding is strengthened by the European prior art which, while ambiguous because of the several conflicting definitions in the term 'niter,' at least suggest to one skilled in the art that potassium nitrate ought to be tried as a cure for tooth pain in general."

Block submitted no affidavits that addressed the substance of the European references. Hodosh's Dr. Shklar, on the other hand, stated why this art, part of the "humors, spirits and Alchemy of the Dark Ages" having whatever medicinal effect they did by virtue of their use of wine, opium, or other narcotic substances, would have been questioned by one skilled in the art. He specifically contends that Block's translation of "nitre" is erroneous: "it is common knowledge that these terms meant sodium carbonate and/or sodium carbonate-sodium bicarbonate mixture...."

To afford a glimpse of the nature of these references, an interesting and typical excerpt, one quoted by the district court, based upon a statement by the long since deceased French surgeon Guy de Chauliac reads that "a mixture of 'cuttlebone, small white sea shells, pumice, burnt stag's horn, nitre, alum, rock salt, burnt roots of iris, aristolochia, and reeds' could create an effective

dentifrice." (District court's emphasis.) Three of the European references are based on that statement. The district court noted the others:

Additionally, a 1693 treatise by the British Professor of Physics William Salmon states that nitrum "held in the Mouth ... immediately helps the Toothach, if burnt and used in a Dentifrice, it cleanses and whitens the Teeth." ... Similarly, a reference work by Hardianus a Mynsicht, translated into English in 1682, describes a mixture, including "nitre" as a "tincture for the toothache." ... Finally, Pliny the Elder, in his Historie of the World, The Second Tome, translated into English in 1601, describes the use of nitre to "easeth the toothach, if the mouth and gums be washed therwith," or if burned, as a dentifrice. [Reference to Exhibits omitted.]

With this description of both the Chinese and European references, and of what they represent as a whole, in hand, we consider the proper application of the Graham standards and their effect upon the propriety of summary judgment in this case. Graham v. John Deere Co., 383 U.S. 1, 17, 86 S.Ct. 684, 693-94, 15 L.Ed.2d 545 (1966); Panduit Corp. v. Dennison Manufacturing Co., 774 F.2d 1082, 227 USPQ 337 (Fed.Cir.1985).

OPINION

A. Summary Judgment

Summary judgment, in patent as in other cases, is appropriate where there is no genuine issue of material fact, and the movant is entitled to judgment as a matter of law. See Molinaro v. Fannon/Courier Corp., 745 F.2d 651, 653-54, 223 USPQ 706, 707 (Fed.Cir.1984). The movant bears the burden of demonstrating the absence of all genuine issues of material fact, and the district court must view the evidence in a light most favorable to the nonmoving party and draw all reasonable inferences in its favor. United States v. Diebold, Inc., 369 U.S. 654, 655, 82 S.Ct. 993, 994, 8 L.Ed.2d 176 (1962); Palumbo v. Don-Joy Co., 762 F.2d 969, 973, 226 USPQ 5, 7 (Fed.Cir.1985). The party opposing summary judgment must show an evidentiary conflict on the record; mere denials or conclusory statements are not sufficient. Barmag Barmer Maschinenfabrik AG v. Murata Machinery, Ltd., 731 F.2d 831, 836, 221 USPQ 561, 564 (Fed.Cir.1984). Summary judgment is authorized where it is quite clear what the truth is. Sartor v. Arkansas Natural Gas Corp., 321 U.S. 620, 627, 64 S.Ct. 724, 728-29, 88 L.Ed. 967 (1944).

B. The Issues Below

The decision and opinion of the district court granting summary judgment dealt with two issues: the first was whether the '006 patent is invalid as anticipated under Sec. 102(b), the court holding it is not;

and the second was whether the '006 patent is invalid for obviousness under Sec. 103, the court holding that it is. Hodosh of course appeals the summary judgment with respect to only the issue on which it lost--obviousness--and Block has not appealed. Because we are remanding for trial, however, we will comment briefly on anticipation to make it clear that we deem that question to

have been conclusively disposed of in this case and because it is closely related to the obviousness issue.

1. Anticipation, Sec. 102(b)

We agree entirely with the district court's holding that the '006 patent is not invalid as anticipated because there is no issue of fact that none of the prior art references discloses every element of the claimed invention. This issue was, therefore, appropriately and properly disposed of by summary judgment.

We do not agree, however, with some of the district court's remarks about anticipation, in particular, that the unavailability of the Chinese references and whether one skilled in the art could locate them with "reasonable diligence" bears on whether those references anticipate the claimed subject matter. Whether a reference is available as prior art and whether it anticipates (i.e., contains every claimed element) are separate questions. Moreover, the district court's determination that the references are unavailable for Sec. 102 purposes seems to be inconsistent with the approach subsequently taken by the district court in determining obviousness. The court later used these same references to support its holding that the claimed subject matter would have been obvious at the time the invention was made to one of ordinary skill in the art.

2. Obviousness, Sec. 103

Questions of material fact remain with respect to the meaning of various terms used in the Chinese and European references and we therefore hold that summary judgment on the ground of obviousness of the claimed invention was improper.

The district court's statement that ya tong means tooth hypersensitivity as well as tooth pain is the resolution of a head-on factual controversy. The court improperly drew the inference against Hodosh, the nonmoving party, that a statement about ya tong made to the German Patent Office by Dr. Hodosh's German Patent Office by Dr. Hodosh's German patent agent was made with knowledge of the Chinese references. The statement in question occurred seven years after the '006 patent issued in connection with Dr. Hodosh's counterpart German application. The statement was: "The supersensitivity of dentine has been known for a long time and can be traced back 4000 years to the Chinese where it was known as 'Ya Tong'." Hodosh in this suit disclaims this statement urging that it was factual error.

There is no evidence that the above statement was based on the Chinese references or that Dr. Hodosh conveyed this information to the German patent agent. The important fact question as to the meaning of ya tong cannot be overcome simply by styling this statement an admission binding on Hodosh. Hodosh is entitled, as Block essentially concedes, to rebut the statement with evidence to the contrary. Hodosh will have that chance at trial.

Nor does the statement in the affidavit of Block's expert, Dr. Wei, that ya tong means tooth hypersensitivity eliminate the presence of the question of the meaning of ya tong. As the Supreme Court long ago observed, "Experience has shown that opposite opinions of persons professing to be experts, may be obtained to any amount ...." Winans v. New York and Erie

Railroad Co., 21 How. 88, 62 U.S. 88, 16 L.Ed. 68 (1859). The substance of Dr. Skhlar's affidavit on behalf of Hodosh goes far beyond merely denying that ya tong means tooth hypersensitivity and thus is more than adequate to show an evidentiary conflict on the record with respect to this crucial point, thus precluding summary judgment. Union Carbide Corp. v. American Can Co., 724 F.2d 1567, 1571, 220 USPQ 584, 587-88 (Fed.Cir.1984).

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Furthermore, a genuine issue of material fact exists with respect to the meaning of the terms nitre, nitrum, and nitri as used in the European references. Dr. Shklar's affidavit is more than adequate to withstand the challenge of this summary judgment motion. A reasonable inference that these terms are sodium, as opposed to potassium, compounds is permissible; Hodosh has shown an evidentiary conflict on the record. The European references, Dr. Shklar explained in his affidavit, are based on the 77 A.D. writings of Pliny The Elder, who understood these terms to mean "sodium carbonate and/or a sodium carbonate-sodium bicarbonate mixture."

The obviousness determination here, given the existence of genuine material issues of fact with respect to the meanings of terms used in these references, is not suitably disposed of by summary judgment under the rules pertaining thereto. See generally Palumbo, supra, and Lemelson v. TRW, Inc., 760 F.2d 1254, 1260-61, 225 USPQ 697, 700-01 (Fed.Cir.1985). The fact issues herein must be resolved by trial in which the conflicting views of the experts will be subject to the refining fire of cross examination, a more effective means of arriving at the legal conclusion of obviousness vel non than perusal of ex parte affidavits and declarations of partisan experts lobbed at each other from opposing trenches.

We observe, for the benefit of the trial court, that we are totally unimpressed by Block's forensic device of comparing the Rosenthal prior art toothpaste formula and the Hodosh toothpaste example in parallel columns and then asserting, as though it were filled with significant meaning, that the "only difference is the use of potassium nitrate in place of strontium chloride," or that "the Hodosh patent merely substitutes potassium nitrate for strontium chloride." This device was pushed to the limit in oral argument by pointing out that the Hodosh toothpaste has the same formula, except for the active desensitizing ingredient, down to the last decimal point. This argument is meaningless on the obviousness issue. "Sensodyne" and apparently other desensitizing toothpaste formulae being well known as commercial products, it is entirely clear that Dr. Hodosh's invention was the discovery of an apparently superior desensitizing agent and he never thought it was a toothpaste formula. He made that invention even if it should later be decided that it was known to the Chinese. It is apparent that Hodosh's patent solicitor merely adopted the prior art Rosenthal toothpaste base formula as a convenient example to illustrate the kind of a paste in which the Hodosh desensitizer might be used, which was within his right. The similarities--indeed, identity--of the paste bases is irrelevant in considering the issue of the unobviousness of the desensitizer. The Rosenthal patent, cited as prior art by Hodosh in his patent specification, was the jumping-off place for the description of his discovery. Hodosh does not claim to have been the first inventor of a desensitizing toothpaste; he claims to have improved it. The issue for trial is whether his improvement would have been obvious. [5]

C. Secondary Considerations

The district court refused on the motion for summary judgment to consider

the evidence of secondary considerations. After acknowledging its existence and the arguments based on it, it stated:

However, the court continues to find that the Hodosh patent is invalid on grounds of obviousness; these secondary considerations stem not from the novelty or inventiveness engendered by substituting potassium nitrate in an already existing formula, but from a lack of knowledge on the part of those in the field of the references here cited. That lack is here overcome by the presumption of omniscience discussed, supra, a rule of law by which the court is bound, whatever its merits.

That secondary considerations are not considered unless there is evidence that those in the industry knew of the prior art is a non sequitur. Evidence of secondary considerations is considered independently of what any real person knows about the prior art. These considerations are objective criteria of obviousness that help illuminate the subjective determination involved in the hypothesis used to draw the legal conclusion of obviousness based upon the first three factual inquiries delineated in Graham. Thus, to require that actual inventors in the field have the omniscience of the hypothetical person in the art is not only contrary to case law, Kimberly-Clark v. Johnson & Johnson, 745 F.2d 1437, 223 USPQ 603 (Fed.Cir.1984), but eliminates a useful tool for trial judges faced with a nonobviousness determination.

The secondary consideration evidence of record and the additional evidence likely to be submitted at trial must be considered in the obviousness determination. Fromson v. Advance Offset Plate, Inc., 755 F.2d 1549, 1557, 225 USPQ 26, 32 (Fed.Cir.1985).

Conclusion

The grant of summary judgment of invalidity is reversed and the case is remanded for trial in accordance with this opinion.

REVERSED AND REMANDED.

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1 A certificate of reexamination confirming the patentability of claims 1-6 of the '006 patent was issued June 21, 1983, as a result of Hodosh's request for reexamination in 1982. Only one of the prior art references involved here, the Rosenthal patent, infra, was considered in the reexamination.

2 Block also initiated regulatory proceedings designed to delay or prevent Richardson-Vicks' marketing of "Denquel." Block, having allegedly failed to comply with Food and Drug

Administration (FDA) procedures before marketing "Promise" and "Sensodyne-F" in competitive response to Richardson-Vicks' introduction of "Denquel," is currently defending itself in forfeiture proceedings initiated by the FDA.

3 The Ming Dynasty (1368-1644 AD) was marked by the restoration of traditional institutions in China and the development of the arts, especially in porcelain, textiles, and painting.

4 Dr. Shklar is the Charles A. Brackett Professor of Oral Pathology at the Harvard School of Dental Medicine, and is an acclaimed expert in dentistry. He is also an expert on the history of dentistry and holds membership in the American Academy of the History of Dentistry.

5 Our comments on the district court's obviousness determination generally include the following tenets of patent law that must be adhered to when applying Sec. 103: (1) the claimed invention must be considered as a whole (35 U.S.C. Sec. 103; see, e.g., Jones v. Hardy, 727 F.2d 1524, 1529, 220 USPQ 1021, 1024 (Fed.Cir.1984) (though the difference between claimed invention and prior art may seem slight, it may also have been the key to advancement of the art)); (2) the references must be considered as a whole and suggest the desirability and thus the obviousness of making the combination (see, e.g., Lindemann Maschinenfabrik GmbH v. American Hoist and Derrick Co., 730 F.2d 1452, 1462, 221 USPQ 481, 488 (Fed.Cir.1984)); (3) the references must be viewed without the benefit of hindsight vision afforded by the claimed invention (e.g., W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 313 (Fed.Cir.1983)); (4) "ought to be tried" is not the standard with which obviousness is determined (Jones, supra, 727 F.2d at 1530, 220 USPQ at 1026); and (5) the presumption of validity remains constant and intact throughout litigation (35 U.S.C. Sec. 285; e.g., American Hoist & Derrick Co. v. Sowa & Sons, Inc., 725 F.2d 1350, 1359-60, 220 USPQ 763, 770 (Fed.Cir.1984)).